

**PM<sub>10</sub> SIP/Maintenance Plan Evaluation Report:**  
**Geneva Nitrogen, LLC.**

**Salt Lake County Nonattainment Area**

**Utah Division of Air Quality**

**Major New Source Review Section**

**October 1, 2015**

# PM<sub>10</sub> SIP/MAINTENANCE PLAN EVALUATION REPORT

## Geneva Nitrogen

### 1.0 Introduction

This evaluation report (report) provides Technical Support for Section IX, Part H.1 and Section IX, Part H.3 of the Utah Maintenance Plan; to address the Utah County PM<sub>10</sub> Nonattainment Area. This document specifically serves as an evaluation of the Geneva Nitrogen plant.

Note on document identification: The intention of the Utah Division of Air Quality is to develop a Maintenance Plan to address PM<sub>10</sub>. As part of this effort, SIP Subsections IX.H.1 Emission Limits and Operating Practices – General Requirements, IX.H.2 Source-Specific Particulate Emission Limitations in Salt Lake and Davis Counties and IX.H.3 Source-Specific Particulate Emission Limitations for Utah County will be repealed and replaced. Subsection IX.H.4 will be repealed and replaced with Interim Emission Limits and Operating Practices. This subsection provides interim limits, consistent with the limits codified in the PM<sub>2.5</sub> SIP, until future controls have been implemented within timeframes identified in Section IX Part H.2.

This evaluation report references the SIP version originally dated June 28, 1991 and made effective by EPA on August 8, 1994. This SIP version is often referred to as the “original SIP.” The Utah County portion of the SIP was further updated on June 5, 2002 and made effective by EPA on January 22, 2003. Additional SIP revisions were adopted by the Air Quality Board on July 6, 2005 and became state law on August 1, 2005. However, this version of the SIP was not adopted by EPA and therefore never became federal law.

In order to distinguish between the various documents in this report, the following coding scheme will be used:

- Since Section IX.H of the 2005 State-only SIP will be repealed entirely and will not be referred to in this report.
- When referencing the original SIP with an effective date of August 8, 1994 the qualifier {OS} will follow any citation from that document.
- In reference to the updated Utah County SIP with an effective date of January 22, 2003 the qualifier {UC} will follow any citation from that document.

Therefore, a particular sentence of this document might read as follows:

*SIP Subsection IX.H.1.c – Stack Testing supersedes 2.a.A<sup>(OS)</sup> from the original SIP.*

### 1.1 Facility Identification

*Name:* Geneva Nitrogen

*Address:* 1165 North 1600 West, Vineyard, Utah, Utah County

*Owner/Operator:* Geneva Nitrogen, LLC

*UTM coordinates:* 4,463,352 m Northing, 437,470 m Easting, Zone 12

### 1.2 Facility Process Summary

Geneva Nitrogen is a Nitrogen Plant that produces industrial products. There are three

manufacturing processes located on site. The processes are the nitric acid manufacturing, ammonium nitrate solution manufacturing, and solid ammonium nitrate manufacturing. The main emission units are two nitric acid plants, one prill tower, two prill dryer vents, and one prill cooler vent.

### 1.3 Facility Criteria Air Pollutant Emissions Sources

The following is a listing of the main emitting units from the Geneva Nitrogen plant:

- Montecatini Acid Plant with low temperature selective catalytic reduction unit
- Weatherly Acid Plant with low temperature selective catalytic reduction unit
- Prill Predryer with cyclone scrubber system
- Prill Dryer with cyclone scrubber system
- Prill Cooler with cyclone scrubber system
- Prill Tower
- Natural gas boiler (25.0 MM Btu/hr) with low NOx burner

This is not meant to be a complete listing of all equipment which may be involved or required during permitting activities at the facility, rather it is a listing of all significant emission units.

### 1.4 Facility 2011 Baseline Actual Emissions and Current PTE

In 2011, Geneva Nitrogen's baseline actual emissions were determined to be the following (in tons per year):

**Table 1: Actual Emissions**

Pollutant	Actual Emissions (Tons/Year)
PM <sub>10</sub>	32.23
SO <sub>2</sub>	0.001
NO <sub>x</sub>	105.89

The current PTE values for Geneva Nitrogen, as established by the most recent AO issued to the source (DAQE-AN0825005-03) are as follows:

**Table 2: Current Potential to Emit**

Pollutant	Potential to Emit (Tons/Year)
PM <sub>10</sub>	111.17
SO <sub>2</sub>	0.03
NO <sub>x</sub>	227.53

## 2.0 Demonstration of Maintaining Attainment

These values have been used in the modeled attainment demonstration. The 2011 actual emissions were used in some fashion. The refineries differed from most of the listed sources in the establishment of projection year inventories. Rather than using a combination of "true-up" 2019 actual emissions plus projection year growth values, DAQ instead simply applied the refineries' individual source-wide emission "Caps" as the 2019 true-up value, and then assigned a growth factor of zero (0) to each of the projection years. In this way, DAQ ensured that the maximum potential emissions from each refinery are what was used for each modeled projection

year. As these Caps are directly established for each listed refinery and are found in the limits of Section IX.H of the SIP, this ensures that the potential emissions will never increase.

Although a specific application of new RACT is not a requirement of the maintenance plan, the limitations found within this maintenance plan are based on the most recent PM<sub>2.5</sub> Section of the SIP. This Section of the SIP required the application of RACT above and beyond the existing controls already required of most listed PM<sub>10</sub> SIP sources. The conditions, requirements and emission limitations contained within this maintenance plan are based on those in Sections IX.H.11, IX.H.12 and IX.H.13 – which comprise the PM<sub>2.5</sub> sections of the SIP, and include this additional RACT application. All requirements from the original PM<sub>10</sub> SIP that have not been superseded or replaced, and which are still necessary will also be retained. By necessary, meaning: needed in the demonstration of attainment of the 24-hour standard, or in demonstrating that no backsliding in the application of RACT has taken place. This is discussed in greater detail in Item 3 below.

### **3.0 Comparison of Requirements – Original SIP and New Maintenance Plan**

Geneva Nitrogen is a previously listed SIP source. In the original PM<sub>10</sub> SIP document for Utah County [IX.H.1 Emission Limitations and Operating Practices (Utah County) – dated 24 September 1990 and Updated June 28, 1991]<sup>{OS}</sup>, Geneva Nitrogen was listed in Subsection IX.H.1.b.H<sup>{OS}</sup> as La Roche Industries, Inc. As a listed source there were several requirements and conditions that applied to the facility.

The original PM<sub>10</sub> SIP for Utah County was superseded in 2002. In the 2002 PM<sub>10</sub> SIP document for Utah County [IX.H.1 Emission Limitations and Operating Practices (Utah County) – dated 24 September 1990 and Updated June 28, 1991]; February 27, 1997, and April 24, 2002]<sup>{UC}</sup>, Geneva Nitrogen was listed in Subsection IX.H.1.b.A as Geneva Nitrogen, Inc.

In addition, Geneva Nitrogen is also a listed source in the PM<sub>2.5</sub> Section of the SIP (see SIP Section IX.H.13.b). As was discussed above in Item 2.0, all limits in this maintenance plan are based on the limits in the PM<sub>2.5</sub> SIP; either in the general requirements of subsection IX.H.13 or the source specific requirements of IX.H.13.b. Therefore, a comparison between the original SIP requirements, and those found in this new maintenance plan can be found below:

### **3.1 Original SIP General Requirements**

#### **IX.H.2.a General Requirements<sup>{OS}</sup>**

The original SIP was a divided document, having two separate sets of General Requirements. The requirements found at IX.H.1.a<sup>{OS}</sup> applied to the listed sources found in Utah County, while those found at IX.H.2.a<sup>{OS}</sup> applied to the listed sources found in Salt Lake and Davis County. As the then La Roche nitrogen plant was located in Utah County, only the general requirements of IX.H.1.a<sup>{OS}</sup> applied.

1.a.A. Stack Testing<sup>{UC}</sup> – this subsection covered the general methods and procedures for conducting stack testing, including the establishment of a pretest protocol, pretest conference, and the use of specific EPA test methods. This subsection has since been updated and superseded by SIP subsection IX.H.1.e which incorporates equivalent language.

1.a.B. Annual Emission Limitations<sup>{UC}</sup> – established that annual emissions would be determined on a rolling 12-month basis, and that a new 12 month emission total would be calculated on the

first day of each month using the previous 12 months data. This subsection is no longer needed as the annual PM<sub>10</sub> standard no longer exists, and no source-specific annual SIP Caps appear in either IX.H.2 or IX.H.3.

1.a.C. Recordkeeping Requirements<sup>{UC}</sup> – established that records need to be kept for all periods that the plant is in operation, for a period of at least two years, and provided upon request. This subsection has since been superseded by SIP subsection IX.H.1.c which incorporates equivalent language.

1.a.D. Proper Maintenance<sup>{UC}</sup> – established that all facilities need to be adequately and properly maintained. Not needed. This is inherent in the NSR permitting program.

1.a.E. Definitions<sup>{UC}</sup> – established that the definitions contained in R307 apply to Section IX.H. This subsection has since been superseded by SIP subsection IX.H.1.b which incorporates equivalent language.

1.a.F. Visible Emissions<sup>{UC}</sup> – covered the establishment of designated opacity limitations for specified process units and/or process equipment. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

1.a.G. Visible Emissions (cont.)<sup>{UC}</sup> – covered the procedure by which visible emission observations would be conducted. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

1.a.H. Unpaved Operational Areas<sup>{UC}</sup> – established rules for treating fugitive dust with water sprays or chemical dust suppression.

### **3.2 Utah County SIP Source Specific Requirements**

Individual source requirements:

1.b.A.1.<sup>{UC}</sup> Stack Testing Limits - A) established the NO<sub>x</sub> daily and annual emission limits for the Montecatini Acid Plant Vent. B) established the NO<sub>x</sub> daily and annual emission limits for the Weatherly Acid Plant Vent. C) established the PM<sub>10</sub> daily and annual emission limits for the Prill Tower. This subsection shows how compliance would be demonstrated by multiplying the most recent stack test results by the appropriate hours of operation for the daily and annual limits.

1.b.A.2.<sup>{UC}</sup> Stack Testing to Show Compliance – This subsection sets the frequency of compliance testing for the limits set in the subsection referenced in 1.b.A.1 above.

The new PM<sub>10</sub> emission limits are lower than the original limits, on both annual and 24-hour basis (see the comparison table below).

The new PM<sub>10</sub> and NO<sub>x</sub> emission limits are lower than the original limits.  
Caps, on both an annual and 24-hour basis (see the comparison table below).

As before, the compliance methodology included in SIP subsection IX.H.2.g.i uses the amount of fuel burned multiplied by the emission factor for each fuel type. Monitoring, recordkeeping and reporting requirements have also been included (for more details, see the discussion of the Section IX, Part H limits outlined in Item 4.1 below).

**Table 3: Comparison Table – Old SIP Caps vs New SIP Caps**

	<b>Montecatini*</b>		<b>Weatherly*</b>		<b>Prill**</b>	
	<b>NO<sub>x</sub> Original</b>	<b>NO<sub>x</sub> New</b>	<b>NO<sub>x</sub> Original</b>	<b>NO<sub>x</sub> New</b>	<b>PM<sub>10</sub> Original</b>	<b>PM<sub>10</sub> New</b>
<b>Annual</b>	140		83.8		86 <sup>\$</sup>	79 <sup>\$</sup>
<b>Daily (24-hr)</b>	0.389	0.370	0.233	0.220	0.24 <sup>\$</sup>	0.22 <sup>\$</sup>
<b>Hourly</b>		30.8		18.4		

\* These emission points do not have a new annual limit or a daily limit. To show a comparison the daily limit is actually 24 times the hourly limit.

\*\* There is no annual limit in the new PM<sub>10</sub> SIP. These limits show a comparison between the 1994 and the 2002 SIPs.

<sup>\$</sup> filterable emissions only

<sup>&</sup> includes condensable emissions

#### **4.0 New Maintenance Plan – General Requirements**

The general requirements for all listed sources are found in SIP Subsection IX.H.1. These serve as a means of consolidating all commonly used and often repeated requirements into a central location for consistency and ease of reference.

IX.H.1.a. This paragraph states that the terms and conditions of Subsection IX.H.1 apply to all sources subsequently addressed in the following subsections IX.H.2 and IX.H.3. It also clarifies that should any inconsistency exist between the general requirements and the source specific requirements, then the source specific requirements take precedence.

IX.H.1.b States that the definitions found in State Rule 307-101-2, Definitions, apply to SIP Section IX.H. Since this is stated for the Section (IX.H), it applies equally to IX.H.1, IX.H.2 and IX.H.3.

IX.H.1.c This is a recordkeeping provision. Information used to determine compliance shall be recorded for all periods the source is in operation, maintained for a minimum period of five (5) years, and made available to the Director upon request. As the general recordkeeping requirement of Section IX.H, it will often be referred to and/or discussed as part of the compliance demonstration provisions for other general or source specific conditions. This recordkeeping requirement includes records of startup/shutdown implementation procedures, as well as CEMS testing data and stack testing data, as applicable.

IX.H.1.d Statement that emission limitations apply at all times that the source or emitting unit is in operation, unless otherwise specified in the source specific conditions listed in IX.H.2 or IX.H.3.

This is the definitive statement that emission limits apply at all times – including periods of startup or shutdown. It may be that specific sources have separate defined limits that apply during alternate operating periods (such as during startup or shutdown), and these limits will be defined in the source specific conditions of either IX.H.2 or IX.H.3.

Conditions 1.a, 1.b and 1.d are declaratory statements, and have little in the way of compliance provisions. Rather, they define the framework of the other SIP conditions. As condition 1.c is the primary recordkeeping requirement, it shall be further discussed under item 4.2 below.

IX.H.1.e This is the main stack testing condition, and outlines the specific requirements for demonstrating compliance through stack testing. Several subsections detailing Sample Location, Volumetric Flow Rate, Calculation Methodologies and Stack Test Protocols are all included – as well as those which list the specific accepted test methods for each emitted pollutant species (PM<sub>10</sub>, NO<sub>x</sub>, or SO<sub>2</sub>). Finally, this subsection also discusses the need to test at an acceptable production rate, and that production is limited to a set ratio of the tested rate.

These stack testing requirements supersede those found in IX.H.1.a.A<sup>{OS}</sup> and IX.H.2.a.A<sup>{OS}</sup> of the original SIP.

IX.H.1.f This condition covers the use of CEMs and opacity monitoring. While it specifically details the rules governing the use of continuous monitors (both emission monitors and opacity monitors), it also covers visible opacity observations through the use of EPA reference method 9.

These requirements specifically supersede those found in IX.H.1.a.C<sup>{OS}</sup> and IX.H.2.a.C<sup>{OS}</sup> of the original SIP. The original SIP requirements of IX.H.1.a.B<sup>{OS}</sup> and IX.H.2.a.B<sup>{OS}</sup>, both of which addressed individual equipment opacity, will be superseded as necessary by the particular source specific limitations found in IX.H.2 or IX.H.3.

Both conditions 1.e and 1.f serve as the mechanism through which sources conduct monitoring for the verification of compliance with a particular emission limitation.

#### **4.1 Monitoring, Recordkeeping and Reporting**

As stated above, the general requirements IX.H.1.a through IX.H.1.f primarily serve as declaratory or clarifying conditions, and do not impose compliance provisions themselves. Rather, they outline the scope of the conditions which follow – the source specific requirements of IX.H.2 and IX.H.3.

For example, most of the conditions in those subsections include some form of short-term emission limit. This limitation also includes a compliance demonstration methodology – stack test, CEM, visible opacity reading, etc. In order to ensure consistency in compliance demonstrations and avoid unnecessary repetition, all common monitoring language has been consolidated under IX.H.1.e and IX.H.1.f. Similarly, all common recordkeeping and reporting provisions have been consolidated under IX.H.1.c.

#### **4.2 Discussion of Attainment Demonstration**

As is discussed above in Items 4.0 and 4.1, these are general conditions and have few if any specific limitations and requirements. Their inclusion here serves three purposes. 1. They act as a framework upon which the other requirements can build. 2. They demonstrate a prevention of backsliding. By establishing the same or functionally equivalent general requirements as were included in the original SIP, this demonstrates both that the original requirements have been considered, and either retained or updated/replaced as required. 3. When a general requirement has been removed, careful consideration was given as to its specific need, and whether its

retention would in any way aid in the demonstration of attainment with the 24-hr standard. If no argument can be made in that regard, the requirement was simply removed.

## **5.0 New Maintenance Plan – Geneva Nitrogen Specific Requirements**

The Geneva Nitrogen specific conditions in Section IX.H.3.b address those limitations and requirements that apply only to the Geneva Nitrogen plant in particular.

IX.H.3.b.i This condition establishes PM<sub>10</sub> and PM<sub>2.5</sub> emission limits for the Prill Tower on a ton per day basis. Emissions are calculated on a filterable plus condensable basis. The filterable plus condensable limits are 0.236 tons PM<sub>10</sub> per day and 0.196 tons PM<sub>2.5</sub> per day.

The condition also includes the definition of a day as being from midnight until the following midnight. Compliance shall be determined daily by applying the emission factors determined from the most current performance test to the hours of operation per day.

IX.H.3.b.ii This condition sets the stack testing frequency and the method for calculating compliance with the limit. The limit shall be verified by stack testing every three years.

Geneva stack tested the PM<sub>10</sub> in 2011 and 2014. The total PM (filterable + condensable) was tested during these two test dates. The next stack test will be conducted in 2017.

IX.H.3.b.iii This condition establishes NO<sub>x</sub> emission limit for the Montecatini Plant on a lb per hour basis. The limit is 30.8 lb/hr.

IX.H.3.b.iv This condition establishes NO<sub>x</sub> emission limit for the Weatherly Plant on a lb per hour basis. The limit is are 18.4 lb/hr and 350 ppmdv.

IX.H.3.b.v This condition addresses testing for the Montecatini Plant and the Weatherly Plant.

Stack testing will be conducted every three years for the Montecatini Plant and every three years for the Weatherly Plant. The Montecatini was tested at two years<sup>(OS)</sup> but has been moved to three years. This enables Geneva Nitrogen to perform a cycle that allows them to conduct a stack test every year. The stack test for the Montecatini Plant was conducted on May 11, 2015, and the Weatherly Plant was tested on May 12, 2015. The next scheduled test will be in 2017 for the Montecatini Plant and in 2018 for the Weatherly Plant.

IX.H.3.b.vi This condition addresses start-up and shutdown of the abatement systems for the acid plants. During periods of start-up or shut-down the SCR's do not maintain normal operating temperature which may result in temporarily elevated levels of NO<sub>x</sub> being emitted. During the shut-down or start-up process it may take up to 2 hours to reach the desired temperature to get the NO<sub>x</sub> abatement within the normal permitted limits to control the NO<sub>x</sub> emissions from the Montecatini or Weatherly Acid Plants.

## **5.1 Monitoring, Recordkeeping and Reporting**

Monitoring for all three conditions is addressed through a variety of methods, depending on the



emission point in question. Stack testing is a viable option, and has been included in the language of IX.H.3.b.i, IX.H.3.b.iii and IX.H.3.b.iv. As appropriate, these monitoring requirements are complemented by the general provisions of IX.H: 1.e for stack testing, and 1.c for recordkeeping and reporting.

## **5.2 Discussion of Attainment Demonstration**

Generally, the calculation methodology for determination of daily (24-hr) source-wide emissions from the Geneva Nitrogen plant is identical to the method used in during the 1991/1992 timeframe of the original SIP and the 2002 SIP. However, several key differences exist:

1. Emissions in the new maintenance plan are lower than in the original SIP

As is shown above in Table 3, the daily SIP limits have dropped for all pollutants of concern [ $PM_{10}$  and  $NO_x$ ]. The annual emissions have also dropped for all pollutants, although no annual Cap is required.

2. Condensable emissions, which were excluded from the original SIP, are included in the new maintenance plan

The original SIP was based on filterable  $PM_{10}$  emissions only. The new maintenance plan includes both filterable and condensable  $PM_{10}$  emissions. The 24-hour source-wide  $PM_{10}$  limit listed in IX.H.3.b.i clearly states that condensable emissions are included, and the emission limits listed in that condition include values for condensable emissions.

## **6.0 Implementation Schedule**

The requirements imposed on the Geneva Nitrogen are effective immediately. While some provision was made for sources generally to implement the RACT requirements of the  $PM_{2.5}$  SIP (and which were included as part of the modeled emission values for each source as discussed in that section above), the Geneva Nitrogen did not have any required RACT modifications to undertake. The emission limits listed in IX.H.2.p can be applied immediately. Similarly, the provisions of IX.H.1.a-f (the General Requirements) can also be applied immediately.

## **7.0 References**

- Geneva Nitrogen,  $PM_{2.5}$  SIP Major Point Source RACT Documentation – Geneva Nitrogen
- Geneva Nitrogen Approval Order DAQE-AN0825005-03
- Geneva Nitrogen Title V Operating Permit 4900082004
- Geneva Nitrogen Stack Test Results (2011-2015)
- $PM_{2.5}$  SIP adopted December 3, 2014 by Utah Air Quality Board

**Evaluation Report – Geneva Nitrogen**

**UTAH PM<sub>10</sub> SIP/MAINTENANCE PLAN**

**Utah County Nonattainment Area**

**Supporting Information**